ROAD SAFETY IN TANZANIA: WHAT ARE THE PROBLEMS?

by

Cuthbert W. Chiduo[*] and Philemon Minja[**]

ABSTRACT

Road Safety is a serious problem all over the world, its severity is more pronounced in the developing countries, especially in Africa. Tanzania being one of the African countries is no exception in this regard. The government of Tanzania has made a commitment to tackle the road safety problem by developing and implementing a comprehensive road safety program with the following objectives:

- *T o establish a road safety organization capable of managing a multi sectorial integrated approach to the road safety problem.*
- *To improve the quality of life in Tanzania by reducing the frequency of road accidents and minimizing their consequences.*
- *To improve undue damage to road pavements through stringent vehicle and axle load control.*

However despite this commitment by the government, the frequency of accidents over the past ten years has increased. The cost of road accidents in Tanzania has recently been estimated at T Shs. 20 billion annually. Overloading on the major highways is estimated at 20-25% hence being one of the causes of undue damage to the road pavement.

This paper therefore discusses problems that have caused the current road safety situation in Tanzania giving emphasis on the institutional set up of road safety activities, traffic legislation, law enforcement, training and education, vehicle safety and inspection, road traffic management and post collision assistance. It goes on to give recommendations on what has to be done reverse this situation so that the number of accidents and fatalities is reduced.

1.0 INTRODUCTION

Road transport in Tanzania account for about 70% and it is the dominant means of transport of goods and passengers. However as important as it is the system has always been accompanied by a good deal of catastrophe emanating from tragic road accidents, which have been increasing year after another. For example last year, 2000, the total number of reported accidents was 14,548 of which 1,441 were fatal causing 1,737 deaths and 14,094 people were injured. It is apparent from Table 1 that the number of accidents has increased steadily since 1990. A total of 223,952.road traffic accidents were recorded for the last twenty years (1980-2000) in which 26,906 people were killed. and 202,952 injured. These accidents cause not only deaths but also

[*] Traffic Enginering and Management Engineer, Road Safety Unit, Ministry of Works, Tanzania.
[**] Vehicle Safety Engineer, Road Safety Unit, Ministry of Works, Tanzania.

usually leaves behind devastated families, untold misery to the respective families, loss of income to the nation and causes permanent disabilities to accident victims. The risk of being killed in a traffic accident in Tanzania proportionate to the number of vehicles on the road is 20-30 times higher than in the USA and many countries in Western Europe. Despite these heavy losses, road safety measures in Tanzania are characterised by procrastination and short lived symbolic crackdown on vehicles following a tragic road traffic accident. From time to time, there is an overwhelming outcry about road traffic accidents in the country and the government is often brought under pressure to do something about this problem which is seen as a threat to human life.

A vicious circle seems to have evolved with the problem of road accidents in Tanzania. The circle goes as follows, (Fig 1) several persons perish in a tragic accident - statements such as no overloading, speed governors are to be installed, no loud music and no speeding are issued - the enforcement officers become more vigilant though not for too long - then they compromise on all issued measures until another major accident occurs. (Khayesi, 1999).

The enormity of the wastage of national resources in road accidents provides the most compelling single reason for seeking every possible means of reducing them. It is also the main justification for government to financially participate in this effort. It must be borne in mind that road traffic safety is not happening by itself but rather it is a result of good programs coupled with political will and priority towards alleviation of road accidents, adequate organisation an sufficient budgets.

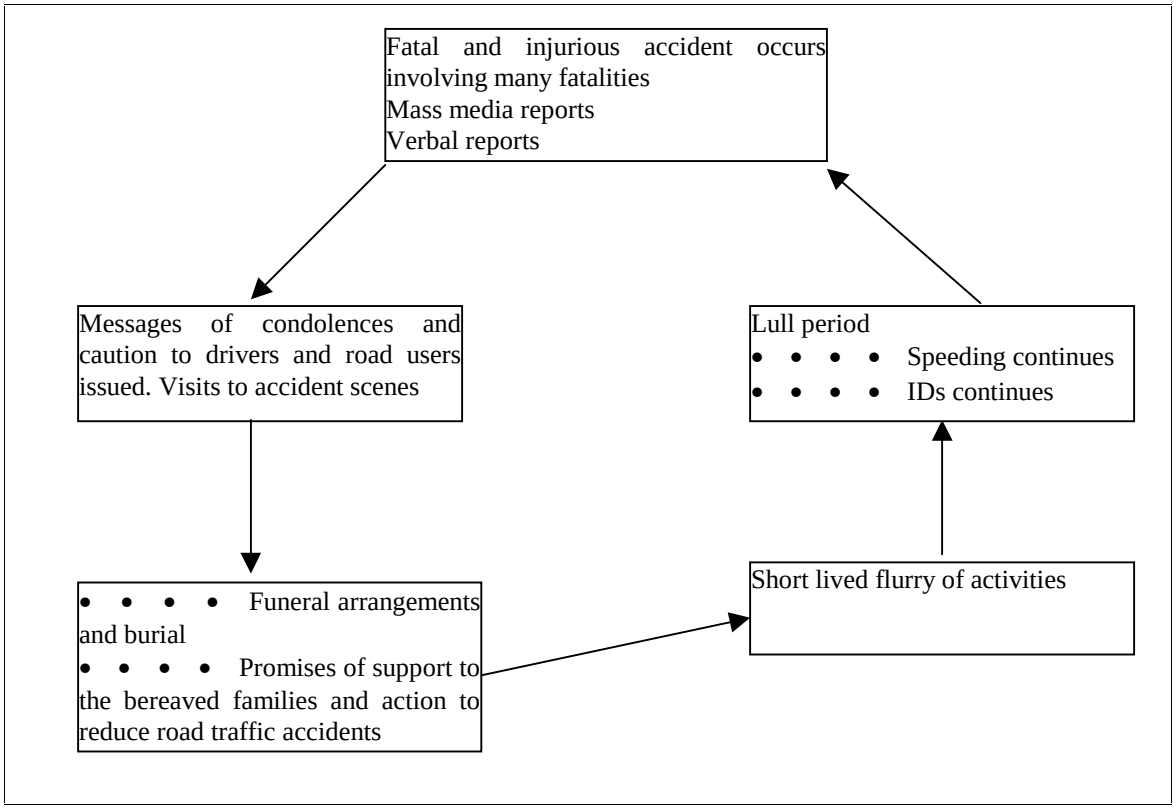

Fig. 1: A Generalised response to Road Traffic Accidents in Tanzania

Table 1. 1: Road Accident Statistics in Tanzania 1980-2000 (Source: Traffic Police)

Year	Total Number of Accidents	Fatal Accidents	Killed Persons	Injured Persons
1980	7,865		954	6,381
1981	9,274		960	6,126
1082	7,037		843	5,897
1983	6,494		827	6,076
1984	7,082		1,021	6,670
1985	8,119		1,071	7,613
1986	7,883		1,038	7.678
1987	9,674		1,117	7,937
1988	9,538		1,256	9,283
1989	9,925		1,116	8,139
1990	10,107	883	1,059	9,910
1991	10,611	959	1,129	10,249
1992	11,865	1,185	1,367	11,406
1993	12,595	1,203	1,483	11,513
1994	13,871	1,346	1,548	12,377
1995	13,767	1,371	1,663	12,625
1996	14,050	1,440	1,809	12,515
1997	14,335	1,323	1,625	12,490
1998	12,234	1,232	1,583	11,381
1999	13,478		1,612	12,845
2000	14, 548	1,441	1,737	14,094

Table 1.2: Road accident fatalities by Road User Group (Source: Traffic Police)

Year	Drivers	Passengers	Motor Cyclists	Pedal Cyclists	Pedestrians	Total
1993	97	597	37	146	606	1,483
1994	100	602	37	202	607	1,548
1995	97	686	43	179	653	1,663
1996	155	790	37	256	574	1,809
1997	90	605	40	227	663	1,625
1998	97	623	46	192	625	1,583
1999	105	638	55	195	618	1,612
2000	127	658	91	231	627	1,737
TOTAL	868	5,199	386	1,628	4,973	13,080

Table 1.3 Trends in Injuries by Group Type.

Year	Drivers	Passengers	Motor cyclists	Pedal cyclists	Pedestrians	TOTAL
1993	635	6837	381	1047	2572	11492
1994	849	7104	475	1203	2746	12,377
1995	665	7281	379	1250	3051	12,626
1996	621	7449	394	1225	2826	12,515
1997	734	6432	502	1164	3658	12,490
1998	583	6321	458	1212	2807	11,381
TOTAL	4087	41,424	2,589	7,101	17,660	72,861

Some indication of the order of priorities in road accident prevention can be gained from the distribution of accident injuries among the various road user classes. Table 1.3 shows the distribution among the different road user classes of injuries. The largest class, passengers include persons killed in cars, buses, and lorries and on motor and pedal cycles. The data then shows that approximately 40% of the fatalities and 57% percent of the serious and slight injuries occur to the drivers and passengers of four wheeled vehicles. Pedestrians are the second most frequent road user class killed, being approximately 38% percent of the total fatalities and 25% of al the injured. Rwebangira et al, (1996) observed the same distribution. Thus measures that reduce these accidents could have a big effect on overall accident reduction.

The large number of killed and injured passengers is probably related to the large population of buses, pickups and lorries carrying passengers that are involved in road accidents These vehicles are often overloaded and the state of repair leaves much to be desired. The pressure on the operators to achieve their daily targets also contribute to the high casualty rates as the buses are often involved in reckless driving while competing for passengers.

2.0 PROBLEMS RELATED TO ROAD SAFETY

2.1 Organisation of Road Safety Work

In Tanzania whilst there are a number of organisations both government and private who are actively attempting to reduce road accidents their efforts have not been co-ordinated. The National Road Safety Council (NRSC) was established by an act of Parliament to take a lead role in promotion and co-ordinating road safety activities in the country. Its membership is made up of representatives from stakeholder ministries, institutions, private companies (insurance, fuel, lottery) and other non-governmental organizations doing road safety work. The National Road Safety Council has failed in its duties as depicted by the increasing number of accidents.

2.2 Driver Training

A driver error is always the most common accident cause identified by Police. It would seem that improvements in driver training have some potential for accident reduction (A. Downing, 1989).

Studies also show that, in developing countries, a large proportion of drivers learn their skills in apprenticeship with other drivers, usually professionals (Muhlrad, 1992). As a result, improving driver training programmes and providing programmed and qualified instructors in recognised driving schools will at first be only profitable to a minority part of the drivers, those who actually join the formal system of training through driving schools. In Tanzania, it is only recently (1996) that legislation has been introduced to make it compulsory that before being tested, the learner driver has to receive instruction form a recognised (government certified) driving school.

Table 2.1 Observations of Causes of Accidents in 6 African Countries.

Causes	**Percentage of accidents**					
	Kenya (1986)	**Malawi (1987)**	**Swaziland (1983)**	**Zambia (1983)**	**Zimbabwe 1988)**	***Tanzania (1998)**
Driver error	44.7	65.7	72.4	60.4	71.3	49.7
Pedestrian error	27.4	13.2	5.2	14.4	11.7	6.5
Cyclist error	4.9	-	3.7	-	1.8	16.2
Drinks /fatigue	1.8	1.0	3.3	1.2	3.2	0.7
Road/ weather	1.8	4.8	1.0	0.7	0.1	7.9
Mechanical fault	6.1	6.3	9.6	5.8	4.4	15.3
Other	14.7	8.9	4.8	8.5	7.5	3.7

Source: Downing, 1989 and *Traffic Police Tanzania

The usual tendency of the Police is to blame road accidents on the road users. It should be noted that there may be some bias on the Police statistics in that reports may underestimate the role played by such factors as a poor road design because the Police investigate the accident with prosecution in mind. A more detailed breakdown of causes given in Table 2.1 indicate that it is usually the driver who is held responsible and in all but one of the five countries driver error was considered to have been the main causes in close to 70 percent of the reported accidents. This in turn suggests that there is some scope for reducing driver's mistakes by improving the training of learners or qualified drivers. (Downing, 1989)

Driver's Licensing System in Tanzania has many loopholes that are hindering the growth of this profession. From onset the preparations for the student to become a driver, there is nothing tangible that could lead the prospector to become a good driver. Learner's Licence is issued regardless of whether the person has any knowledge of the dangers he is exposed to or rather a little knowledge of the road and its environment.

Most of the driving schools in Tanzania have vehicles which are not well maintained. Many confine their instruction to handling the vehicle on the road. Such a deficiency in the training syllabus must reduce the pupil's chances of passing a test. Analysis of the evidence given in respect of driving schools leaves no doubt that the standards of instruction given to paying pupils vary immensely. In teaching of any sort, so much depends upon the capabilities of the instructor, his knowledge of his subject and his capacity to impart such knowledge to others. With so much unemployment in the country, it is not surprising that many people, are pinning their hopes of a job on their ability to drive a vehicle.

We believe that a learner driver who is badly taught, and who does not therefore acquire the basic principles upon which driving skill may, with experience, be developed, is unlikely ever to become thoroughly competent.

It is the duty of the government to provide the public with safeguards so that they may be certain that any establishment which purports to teach driving shall be qualified in every respect to do so. This is lent support by the legislation governing the establishment and running of schools offering academic education, whereby any such establishment which instructs more than nine students at any one time is bound to maintain certain minimum standards of efficiency.

Most driver training is directed more at encouraging compliance with laws than with conveying information about rules and procedures. Training provides drivers with skills, which are then rehearsed again and again in the traffic stream. The driver becomes very good at these, but this form of training is of little benefit when confronted with an unusual situation requiring him to make a split second decision.

To alter undesirable behaviour like driving under the influence of alcohol, is very difficult by public campaigns alone. This would in other traffic safety areas, particularly from the safety belt campaigns (Tlale, 1994). Campaigns to influence drinking and driving generally only result in increased knowledge, rarely alter behaviour, and the effects are often only temporary (Tore Vaaje, 1987). It is more likely that legislation will influence values and the understanding that drinking and driving is dangerous.

2.3 The Pedestrian

The figures in Tables 1.2 and 1.3 show that pedestrians suffer more fatalities and injuries than any other single road user except passengers. These statistics indicate that measures to reduce the pedestrian involvement must be given priority. In Tanzania pedestrians are forced to walk on the carriageway due to vehicles parked on the footway and also the footway is sometimes used by petty traders. In the rural areas where walking is a major mode of transport, pedestrians are placed at considerable risk due to the higher speeds of traffic and lack of pedestrian facilities, A particular problem is the high percentage of pedestrians and in some cases also the bicycles which use the same carriageway as motorized traffic. Even where there is sufficient space, physical segregation between the various road users is not commonly used, due to limited financial resources. This generally constitutes a very serious road safety problem particularly in urban areas.

On the highway most of the bridge widths are narrower than the approach lanes and they do not have a segregated footway, thus the pedestrian cannot make a safe decision on whether to commence crossing.

2.4 Road User Education

There is still no co-ordinated system of safety education, it has never been a compulsory part of school curricula in Tanzania. It is only in the last few years that curricula has been prepared and a pilot project is ongoing in three out of twenty regions in the Tanzania mainland.

Coupled with the previously established lack of school education it seems likely from the above that the majority of pedestrians and cyclists as well as a high proportion of motor vehicle drivers have never seen or been instructed on the highway code. The overall picture is of a population largely unaware of the way the law and community agreed protocol requires them to behave on the road.

Table 2.2 Road safety education in different countries

Country	Accident Rate (Deaths Per 100 Million Km Travelled	Road Safety Education
USA	1.8	Compulsory
Canada	2.9	Compulsory
Denmark	2.6	Compulsory
Finland	2.0	Compulsory
France	4.6	Partly Compulsory
West Germany	3.8	Compulsory
Great Britain	2.1	Compulsory
Luxembourg	3.5	Compulsory
Norway	2.29	Compulsory
Israel	4.2	Compulsory
Turkey	12.0	Not compulsory
Sierra Leone	23.6	None
South Africa	16.8	Partly compulsory

Source: Accident rates obtained from report of International Road Federation 1986**.**

It appears from Table 2,2 that those countries where road safety education is compulsory, the accident rate is relatively low, and in countries where road safety education is partly compulsory or where there is no road safety education at all, the accident rate is relatively high**.**

2.5 Speed Limits

There is clear evidence of the effect of speed on accident rates and accident severity. The energy to be dissipated in an accident is proportional to the square of the impact speed. For example an impact speed of more than 130km/hr involves more than twice the energy of one at 90km/hr.(Ogden.1996 p363). Moreover in many accidents the impact speed is well below the travel speed as drivers have managed to brake but not stop their vehicles before the collision. As travel speeds drop, therefore the impact speed drops, also the collision may in fact be avoided. Lay (1986,p363) has suggested four factors which contribute to greater hazard at higher speeds, namely that the

vehicle becomes less stable at higher speeds, the driver has less time to react, other road users have less time to react, and the severity of accidents increases, as mentioned above.
Public transport vehicles are the majority of traffic violators on the roads of Tanzania. This is caused mainly by the driving behaviour which is dictated by their personal interest to make as many trips as possible per day. As a result they exceed the speed limits. The minibus “daladala” drivers are notorious for the reckless driving displayed as they compete for passengers. Their vehicles usually make unexpected stops that cause traffic congestion.

The means of controlling upcountry bus speeds already exists within the existing scheduling legislation. The Central Licensing Authority is responsible for setting bus time tables for buses going upcountry and towards Dar es Salaam. Legislation requires buses not to exceed 80 km/hr. However time tables issued to bus operators force drivers to travel at speeds higher than this. The Traffic Police enforce this speed limit. Drivers are forced to slow down on sections where enforcement of speeds is being carried out and speed up above the limits at all other uncontrolled sections, Drivers inform each other of the presence of Traffic Police through radios and mobile cell phones.

2.6 Vehicle Inspection

The condition of the vehicle on the road may determine whether an accident would actually occur given the presence of other contributing factors. Improvements in vehicle design, occupant protection and vehicle maintenance have made significant contribution to accident reduction in the developed countries (Ross et. al., 1991).

Periodic inspection of vehicles is among measures intended to ensure that those parts of a vehicle which influence safety reach minimum standards of performance. They are usually a series of quick tests and if inspection is compulsory, vehicles which fail must be brought up to standard before again being used on the road. Vehicle inspection is carried out in the belief that the risk of being involved in an accident is greater for a badly maintained vehicle than for one in good condition and than t the tests will result in an improvement in the condition of vehicles and will reduce the number and severity of accidents. Other benefits which may result are decreased maintenance costs because defects are found at an earlier stage and greater comfort as for example when glare is reduced by the accurate aiming of the headlights.

The case of inspection of all vehicles rests on the results of studies made in numerous countries of the world which show conclusively that the performance of components vital to the safe operation of a vehicle deteriorate with age. It would cause administrative chaos of a decision to implement inspection of all vehicles were thrust upon the existing Traffic Police. It is suggested that consideration might be given to gradually phasing -in vehicle inspection requirements.

Another way of lessening the burden on official test facilities would be to licence garages having the necessary equipment and trained personnel to carry out vehicle inspections.

2.7 Road Engineering

Road faults are rarely listed on individual Police accident reports and the most efficient way of locating them is by observing the distribution of accidents on the road system. Clusters of accidents over a period of months or years at any junction or section of road usually indicate some form of design defect. A detailed study of all the individual accident reports at the one location or site inspection will usually reveal the deficiency. Engineers in Tanzania are still designing and constructing roads with little consideration for safety. Political decisions sometimes overrule safety provision for example in one project it was very difficult to convince the authorities to allow provision of a walway instead of an extra kilometre of a tarmac road.

2.7.1 Road signs and markings

Road signs are an integral part of a modern road system. They convey significant safety benefits as well as user amenity. Signs will remain functional and achieve their safety objectives only if they are adequately maintained They fade under sunlight, are subject to damages by vehicles and vandalism, and often do not command a high profile in an agency's maintenance program. Tignor (1993) indicates that the installation of curve warning signs leads to a 20 % average accident reduction. Pak-Poy and Kneebone (1998,p 40) quoted a Canadian study which in turn drew on other references which claimed a reduction of 20-57 percent reduction in accidents when warning signs were provided.

With almost every newly built/rehabilitated road in Tanzania road signs and markings are provided. However with time these are vandalised, stolen and some removed by (we suspect) drivers. Traffic Police on the highway enforce speed limits especially at villages where the speed limit is 50 Km/hr and they catch many offenders. After a few weeks of the exercise the signs disappear thus the Police cannot do any enforcement without having the road signs in place. It can rightly be conclude that those who would benefit from the absence of the road signs are the culprits.

Road signs deteriorate with age. They need to be maintained but shortage of funds is a problem and even when they available repair of the pavement has precedence over the road signs and markings.

2.7.2 Traffic signals

Traffic signals are widely used as an intersection control device in urban areas where they meet capacity and safety objectives. By separating in time the use of road space across major traffic flows, they have potential to significantly reduce conflicts. In their simplest form they operate under fixed time sequence and also vehicle actuated (i.e. respond to traffic demands) and increasingly are co-ordinated to provide control of the network as a whole. It is apparent that the installation of traffic accidents will reduce the number and severity of accidents.

In Tanzania legislation has been introduced in 1996 whereby The Traffic Police have precedence over traffic lights. This legislation was made for the safety of the Traffic Policeman but implementation leaves a lot to be desired. A confusing situation sometimes leading to accidents has surfaced whereby the Police direct traffic while the traffic lights are working. Taking the case of two lanes for vehicles going straight and one lane for vehicles turning, the Traffic Police is usually positioned facing the median and oncoming traffic. But the drivers of vehicles on the lanes going straight

cannot see him and will believe they are being guided by overhead traffic lights which are visible to them. Only when they reach the intersection will they be able to see the Police who might by then be allowing the vehicles from the other direction. This causes vehicles to brake suddenly due to their expectancy having been interrupted and a collision may occur. Records from MAAP5 for Dar es Salaam show 44, 42 and 40 accidents occurring at signalised intersections controlled by Police.

Howie and Oulton (1989) report two studies of the effect of Police enforcement on driver behaviour at signalised intersections. The first found that the presence of surveillance, whether continuously by mechanical means or sporadic but frequent by patrols, reduces the incidence of unsafe behaviour of drivers. They found that as long as surveillance remains evident its effect on the driver's behaviour continues. The second study which was a Swedish investigation showed that the average approach speeds and percentage of traffic signal violations dropped significantly with visible police supervision of the site. The traffic police could very effectively be utilised for surveillance than directing vehicles at signalised intersections,

2.8 Penalties for Traffic Offences

The Road Traffic Act was enacted in 1973. At that time, fines were 2,000 to 3,000 shillings and this was recently reviewed in 1996 to 20,000 t0o 30,000 shillings. The revised penalties are not deterrent enough.

2.9 Medical and Rescue Services

The post crash phase involves efficient treatment and rehabilitation services to cope with the injured. Road deaths typically occur in three distinct time periods (Trinca et. al, 1988, p.72):

- In the crash or within minutes of it; approx. 50 percent of road deaths occur in this period. However it occurs in only 5 percent of casualty accidents and there is little that medical science can do for this group.
- Within the period 1-2 hours after the accident, about 35 percent of the deaths occur in this period, from about 15 percent of the casualty accidents. Increased survival rates are likely to result from early and appropriate medical efforts.
- Within 30 days of hospital admission. Approximately 15 percent of deaths occur at this late stage. Major causes are brain death, organ failure, and infection.

The majority of badly injured victims of all the reported accidents in Tanzania die from injuries before they can reach the hospitals.

This probably happens because the victims are being taken care of by occasional road users who have no training in first aid or medical treatment. Many of the victims would have survived the accident with satisfactory treatment by qualified personnel. Presently there is no effective ambulance service in Dar es Salaam the major city of the country with 3 million inhabitants and where 35% of all accidents occur. Services in other parts of the country are no better off than in Dar es Salaam.

2.10 Accident Data

A common factor of central importance in road safety management is the collection and use of accurate and comprehensive data related to road accidents. The

interpretation of those data can lead to a better understanding of operational problems, and is a pre-requisite for accurate diagnosis of accident problems, assists in the development of remedial measures, and allows us to evaluate the effectiveness of road safety programs (Ogden, 1996).

The prime characteristics of an accident database management system (O'Day, 1993) are:

- Competent accident reports, supported by training and supervision
- A report form attuned to users' needs.
- Attention to detail in the preparation of reports
- Accurate data entry and processing
- Free-flowing output to interested parties and
- Feedback of user comments to induce system improvement

A computerized accident recording and analysis programme known as MAAP5 has been in use in Tanzania since 1995. The program is now in use in 8 out of 20 regions in the country and plans are to introduce it to the remaining 12 regions. Data is collected from the upcountry regions by diskettes to a central database at the Traffic Police headquarters and is then used by different stakeholders. However there are mistakes that are made by the staff who enter data into the computer. These are corrected and short courses are held from time to time to make the staff more competent. The Ministry of Works has started using data from Dar es Salaam region to propose countermeasures to accident blackspots identified by MAAP5.

3.0 OBSERVATIONS

- The organization for Economic Co-operation and Development (OECD) (1981, p6) noted that traditionally, the underlying assumption has been that enforcement would result in a reduction in mean speed and in the spread of speeds, and this in turn would lead to a reduction in accident numbers and severity. In particular enforcement at a specific site and time brings the average speed close to the posted speed; the effect on variability is less pronounced but despite reservations about the effect on speeds, the high levels of surveillance reduce the numbers of ***fatal and injury accidents***. These conclusions are consistent with the observations of Aux (1993) and Zaal (1994).
- The wide spread use of portable speed cameras has produced a change in driver attitude in Australia. Aux (1993) has pointed out that to avoid undue criticism of the use of speed control devices it is essential to carefully establish the criteria of the sites in which they are to be deployed. Acceptance in Australia has largely been a result of very good Police implementation and a focus on only those sites with a legitimate speed problem.
- The 1-2 hour period after the accident has a major impact of post - injury management. It is primarily dependent upon roadside and hospital emergency treatment which as explained under section 2.9 above are non existent due to the public having little training in first aid and having no reliable ambulance services.
- It is common that on many urban roads, footpaths are non-existent or in poor condition particularly in wet weather. A motorist has a greater duty to be careful

when approaching a zebra crossing than any other part of the road, and that an alteration to the law is necessary to give priority to pedestrians on zebra crossings and to make it an offence for motorists who fail to do so.

- Total segregation of motorized and non motorized traffic is a good way to improve road safety. It reduces or eliminates conflicts. Pedestrian routes need to be more direct and attractive than motor roads otherwise they will not be used.(Tlale,1994).
- Pedestrian, cyclist, motorcyclist, motorist and professional drivers were all at one stage children. This shows that the participation in road traffic starts very early for a small child one is already faced with the dangerous situation in the street. That is why it is of prime importance to become aware of the danger and traffic rules at an early age. The objective in starting traffic education from the base is to integrate it into the nursery, primary and secondary school education, home traffic education is also indispensable (DHV, 1981). Pedestrian training seems to be effective perhaps because it is learned behaviour, instilled at childhood when a person is most susceptible to training and learning. The difficulties experienced by pedestrians when they go to a country where the traffic drives on the wrong side of the road, underlines that pedestrian behaviour is deeply ingrained.

4.0 RECOMMENDATIONS

- Provide training of care providers i.e. emergency medical personnel, first aid to the general public, emergency personnel training in roadside care, training of public utility workers and tow truck operators. Provide efficient and effective transport of victims to hospital by providing ambulance services. This requires funds but it should appear in budgets of municipal and local authorities. Training of health professionals and hospital staff in road trauma treatment.
- The Highway code must be made easily available to all sections of the community and the buying and reading of it more actively encouraged. To this end consideration might be given to distributing a copy of the Highway Code with every provisional driving licence.
- The Pilot road safety education program should be extended to the whole country upon completion. Detailed instruction in road safety should be a compulsory part of the curriculum of all schools. A comprehensive program of education, starting with the very young and extending progressively through to the University graduate and Industrial or commercial trainee should be worked out.
- The Traffic Police should be supplied with the necessary equipment and facilities to carry out their tasks. Much can be done with a small team of Traffic Police to enforce particular safety related topics (e.g. brakes, tyres, parking) in addition to alcohol testing and speeding for short periods at a variety of sites each day.
- The Police should not direct traffic while the lights are working at signalised intersections. If it is necessary to do so then the lights should be set at flashing yellow continuously.
- A road safety audit system backed with proper legislation should be set up in Tanzania.
- Local garages or an agency can be formed to carry out vehicle inspection. Mandatory vehicle inspection for all vehicles 3 years old should be established.

The vehicles are to be inspected once annually. It is proposed to use the Police only for roadside inspection.

REFERENCES

1. Axup, DR (1993), Enforcement in the Traffic safety toolbox: A Primer on Traffic Safety, pp 215-224 (Institute of Transportation Engineers, Washington, DC).
2. DHV Consulting Engineers (1981) Road Safety Campaign, Round Table Paper (Ministry of Transport, Cameroon).
3. Downing AJ, (1989), Driver Training in Africa, (TRL, UK).
4. Howie DJ & Oulton G, (1989), Crashes at Traffic Signals. (Monash University Accident Research Centre, Melbourne, Australia)
5. Lay MG, 1986, Handbook of Road Technology (2 vols). 712p plus appendices. (Gordon and Breach, London).
6. Khayesi M (1999) An analysis of the Pattern of Road Traffic Accidents in Relation to selected Socio-Economic Dynamic and Intervention Measures in Kenya. Ph.D. Thesis.
7. O'Day J (1993) Accident data quality. National Co-operative Highway Research program. Synthesis of Highway Practice 192. 48p. (Transportation Research Board, Washington, DC).
8. Muhlrad N,(1992), Institutional Dimension of Safety Projects Experience In Developing Countries. Institute National Recherche Sur Les Transports Et Leur Securite (INRETS).
9. Ogden, K.W 1998, Safer Roads: A guide to road safety engineering, (Avebury Technical).
10. Pak-Poy & Kneebone Pty Ltd (1988) Road safety benefits from rural road improvements. FORS Report CR 71. 171 P. (Federal Office of Road Safety, Canberra Australia).
11. Ross et al (1991) Towards Safer Roads in Developing Countries. 220p. (TRL, Crowthorne, UK).
12. Rwebangira et al., 1996, Road Safety Program for Tanzania.
13. Tignor SC 1993, Traffic Control Devices: Overview, in the Traffic Safety toolbox: A primer on Traffic Safety pp 45-52. (Institute of Transportation Engineers, Washington, DC).
14. Tlale MA, 1994 Road Safety In Lesotho, MSc. Thesis, 101p. (IHE, TU Delft Netherlands).
15. Trinca et al, 1988 Reducing Traffic Injury - A Global Challenge. 136p (Royal Australasian College of Surgeons, Melbourne, Australia.
16. Vaaje, Tore (1987) Organisation of Road Safety Work in Southern Africa (Institute of Transport Economics, Oslo).
17. Zaal, D (1994) Traffic Law Enforcement: A review of the literature, FORS Report 53, 188 p. (Federal Office of Road Safety, Canberra, Australia).